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THE RARER BIRDS OF THE SOLWAY FIRTH.

By the Rev. H. A. Macpherson, M.A.

The region which lies around the upper waters of the Solway Firth has experienced important changes since the days when Roman legions manned the forts that overlooked the channels of this great Firth against the attacks of northern warriors. Great forests of oak and other indigenous timber then extended from the base of the hills to the sea-beach. The foreign garrisons must have needed trustworthy guides when they sent out parties in search of forage, for so difficult was the country, and so dangerous were the watery depths of its reed-fringed morasses, that the utmost care must have been needed to avoid ambushed parties of the enemy. The forest glades in which the hind cropped the coppice-wood have long since been furrowed by the plough; the pedigree Shorthorn grazes on pastures over which herds of Aurochs once stampeded. Even the Bittern has no abiding-place among the bogs that still linger in the Abbey Holme. It is the preservation of such isolated tracts of broken moorland as we find in Salta Moss or Weddholm Flow that help us to picture this area as it existed in the days of our distant forefathers. The romance that once invested this wild country has well-nigh disappeared. Only here and there can we find the Merlin or the Short-eared Owl feeding their downy young among the heather; even the Red Grouse is scarce as a breeding bird upon the moors which lie adjacent to the foreshores. The numbers of the very Dunlins that nest in the tussocks of the salt-marshes have grown fewer within our own recollection.

But there is no material change in the numbers of migratory birds which appear in the neighbourhood of the Firth at different seasons of the year, and close study has enabled us to gauge of their movements with greater accuracy than would have been possible formerly.

Ornithologists have their share of "hopes deferred," and the writer has to own to many disappointments. Though it is believed that *Anthus cervinus* has twice occurred in the neighbourhood of the Firth in spring plumage, no specimen has ever been secured. A Black-throated Wheatear of some description has visited the vicinity of the Solway Firth in three different springs, but no final proof of its identity has been obtained. Several other species are still excluded from the ornis of this region, because their identification, in spite of much labour, is still lacking. But the data at the disposal of the writer extend over so long a period, that he feels justified in offering for consideration the following observations:—

1. *The Absence, or exceptional Presence, of North American Birds.*—The arms of the Solway Firth extend in a south-westerly direction into the Irish Sea, an area swept by heavy gales and frequent hurricanes. It would not be unreasonable to expect that such common Passerine forms as *Turdus migratorius* or *Loxia leucoptera* might occasionally be transported by some ocean liner to within a reasonable distance of the Firth, and be driven ashore; but the only species that have been reported to the writer as captured at sea represented such familiar Palæarctic species as *Fringilla cœlebs*, *F. montifringilla*, or *Turtur communis*. We cannot even claim that *Tringa maculata* has occurred within our precise limits, often as that bird has been killed in Britain. *Macrorhamphus griseus* and *Tryngites rufescens* have occurred in single instances, but very far up the Firth, and only in the month of September. Of the *Anatidæ*, *Œdemia perspicillata* has only once been obtained in the vicinity of the Solway. *Querquedula discors* has once occurred in Dumfriesshire, at no great distance from the Solway Firth.

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2. *Birds from Eastern Europe.*—Mature reflection favours the belief that comparatively few species visit the shores of the Solway Firth from Eastern Europe. We have no local finds of *Turdus varius* or *T. sibiricus:* no rare *Phylloscopi;* no notes of *Lanius minor* or *Muscicapa parva;* no Asiatic Buntings; and not one occurrence of *Falco vespertinus.* It is true that *Saxicola isabellina, Tadorna casarca, Glareola pratincola, Cursorius gallicus* have visited us at long intervals; but what are these among so many absent species? It must be admitted that *Anthus richardi* and *Pastor roseus* are believed to have occurred repeatedly, the former species in both spring and autumn. *Ruticilla titys* has only twice occurred, yet it cannot be easily overlooked, as it occurs so late in the season. In vain have we searched, year after year, for such birds as *Totanus stagnatilis, Charadrius fulvus, Recurvirostra avocetta,* or *Numenius tenuirostris.* It is conceivable that some of the commoner British birds visit us from the east, such as *Garrulus glandarius;* but an incursion of Jays is at least as likely to owe its *fons et origo* to the pine-woods of Norway. Certain birds, of which *Anthus richardi* is the safest example, do appear to visit us from the east; but most eastern Palæarctic birds are chiefly remarkable for their absence.

3. *Birds from Scandinavia.*—A number of species appear to visit the Solway Firth from Scandinavia, including *Turdus pilaris, T. iliacus, Lanius excubitor, Bombycilla garrulus, Acanthis linaria, Fringilla montifringilla, Chrysomitris spinus, Corvus cornix, Otocorys alpestris, Dendrocopus major, Buteo lagopus, Asio brachyotus, Columba palumbus, Clangula glaucion, Mergus merganser, Strepsilas interpres, Scolopax rusticula, Gallinago gallinula, Machetes pugnax, Totanus canescens, Limosa lapponica, Colymbus septentrionalis.* But of these, *Machetes pugnax* only occurs—normally, at any rate—in autumn; while *Otocorys alpestris* and *Buteo lagopus* have hitherto proved to be very rare visitors. Possibly *Chrysomitris spinus* and *Mergus merganser* visit the neighbourhood of the Solway Firth from the north of Scotland. *Acanthis linaria* is relatively rare in the neighbourhood of the Solway Firth, or at any rate *appears to be;* possibly, if there were any London birdcatchers at work with clap-nets near the Solway, we might hear of the capture of various small species which at present are overlooked.

4. *Icelandic Forms.*—It is reasonable to argue that *Cygnus musicus, Bernicla leucopsis, Tringa striata, T. canutus, Calidris arenaria, Numenius phœopus, Colymbus glacialis, Motacilla alba,* and possibly *Plectrophenax nivalis, Dafila acuta,* and *Chaulelasmus streperus* visit the Solway Firth from Iceland, and the continents or islands lying north or north-west of Iceland, as their breeding-grounds in several cases must be looked for in Iceland. *Calidris arenaria* sometimes arrives on the sands of the Solway late in May in thousands, though in autumn this species only occurs in small parties on the same foreshores. It is also a winter visitant.

5. *North European Forms.*—Great interest attaches to certain species which appear to visit us from their breeding-grounds in the extreme north of Europe, east of the Varanger Fiord, including *Cygnus bewicki, Bernicla brenta, Tringa minuta, Squatarola helvetica, Totanus fuscus.* The last named is not obtained annually on the Solway Firth, but few seasons, if any, pass without its note being recognized. It occurs between August and November, in immature dress. *S. helvetica* often appears on the estuaries in autumn in almost perfect nuptial garb, and full-dressed birds are seen in May. This species appears to be very rare in Western Britain north of the Solway Firth. It has been said that few, if any, Grey Plovers leave England in spring from any point north of the Humber basin; but this is a mistake. The fork of the Solway *may* act like a funnel, to catch up such individuals as have made their way up the Irish coasts, and desire to migrate in an easterly direction. But this Plover does not occur on the open coast of Cumberland, except as a straggler; it is not until the higher reaches of the Firth are attained that the Grey Plover checks its flight to alight upon the wet sands that it haunts so assiduously. *Tringa minuta* has occurred in every month from August to January, and exceptionally in June; but *September* is the month in which it usually appears, and at that season only young birds have been procured. As for *Cygnus bewicki,* it has occurred as early as October, and as late as April; but is usually met with in winter. Adults largely outnumber the cygnets, for Swans are very long-lived.

6. *Pelagic Birds.*—The wanderings of the various species of *Laridæ* ought, strictly speaking, to be recorded by some seafaring

naturalist. *Larus minutus* occurs in almost every month in the vicinity of the Solway Firth. It has been obtained in January and February, seen in March, shot in April, shot in June; we have no knowledge of its presence in May or July, but it has been reported in August, and obtained in all the four remaining months of the year. We have seen nestlings a few weeks old, before they had lost first plumage ; others in the plumage of the first winter ; another in its second summer ; another in its second winter ; as well as (in single cases only) adults obtained locally in full winter and summer garb. *Larus glaucus* has not occurred in quite full plumage, and only in winter. *L. icelandicus* has only occurred in immature dress, and that in winter. *Stercorarius pomatorhinus* has generally appeared in October, but once as late as Dec. 22nd. This Arctic bird has never appeared in spring. *S. parasiticus*, on the other hand, has once appeared in spring or early summer; October is the month in which it normally occurs. *Mergulus alle* occurs fairly often between November and February.

ON THE BREEDING HABITS OF THE SWIFT IN DERBYSHIRE.

By the Rev. F. C. R. Jourdain, M.A., M.B.O.U.

Although a widely distributed bird, *Cypselus apus* is difficult to observe at nesting-time, on account of the inaccessibleness of its usual breeding-places. Presumably this is the reason for the uncertainty which exists with regard to one or two points in its history.

The Swift is one of the most regular of our migratory birds, and is usually first seen in this county between May 2nd and 5th. Mr. Storrs Fox has seen one at Bakewell as early as May 1st, but May 4th may be taken as the average date, and it is not at all uncommon for them to arrive exactly on that day. Although they resort to the nest-holes before that time, eggs are seldom found before the last days of May, and about the same numbers seem to return every year. Most nests in this neighbourhood are made under the eaves of lofty buildings or in thatch, but some pairs may be found nesting in the natural crevices of the steep limestone rocks at Dovedale and other places. The Swift can squeeze itself through a remarkably shallow opening, barely wide enough to admit the fingers, and the nests are usually some little way from the entrance. Where suitable sites are available, they seem to prefer to breed in company, but a single pair may often be found nesting at some distance from any colony. For over thirty years a colony of seven to eight pairs has nested under the eaves of a house in this neighbourhood, which stands by itself on a hillside, and offers unusual facilities for observation.

The first thing that strikes one in watching these Swifts is that they play a regular game. On a summer's evening some five or six birds may be in sight, hawking busily in different directions, when suddenly one will dash off towards the house screaming. Every Swift in sight at once joins in the chase, and the flock race round and round the house, invariably in one direction, passing close to where the nests are, and screaming all the time. The sitting birds squeal in sympathy as the flock dashes past, and, after several complete circuits, the squealing ceases, the flock suddenly disperses, and desultory hawking is resumed, until the signal is again given, and another game is started. Occasionally one sees short chases carried on in the open, but the recognized course is round the house, and the game is repeated time after time on a fine evening. When the birds are laying the eggs often roll out of the nest, especially when Starlings and Sparrows dispute the possession of the holes, and fragments of broken eggs are usually to be found underneath the breeding-place of a colony.

With regard to the number of eggs laid by each hen, there is some difference of opinion. The point is one worth investigation, especially as it has an important bearing upon the question as to the position of the *Cypselidæ*. Mr. Howard Saunders, in the new edition of his 'Manual,' says:—"The eggs . . . are two in number, and when more are found in the same nest they may be the produce of two females." In the same strain, Dr. A. G. Butler writes:—"The number of eggs is normally two; four eggs have been found in one nest, but it has yet to be proved that they were the product of the same hen." On the other hand, Prof. Newton, and many other authors, give the number as two to three, and even four. Lord Lilford says "generally three," and Mr. O. Grabham (Zool. 1898, p. 352), who has found three eggs in Swifts' nests often, even in isolated nests, comes to the conclusion that "the evidence is strongly in favour of the hen-bird by no means infrequently laying three eggs." In some interesting notes on the Swift, by Mr. Steele-Elliott (Zool. 1900, p. 479), is an account of a nest which contained three eggs, and was only observed to be visited by one pair of birds. This is confirmed by a note (p. 556) from Mr. A. Bankes, who observed the same thing for two successive years.

In the colony at Ashburne, to which I have already referred, I have often found nests with three eggs, and on one occasion with four: but of course there was no proof that all the eggs were laid by the same bird, except perhaps the similarity of the eggs in each clutch to one another. This year, by first ascertaining the number of old birds, and afterwards carefully examining as many nests as possible, I have obtained the following results:—

Number of birds in colony, fourteen. Number of nests, seven (each with sitting bird on June 11th).

1st nest was built on the top of a Sparrow's nest, and contained two incubated eggs, while the remains of a third egg were lying on the ground below.

2nd nest.—Three eggs slightly incubated.

3rd nest.—Three eggs of a very elongated type about half-incubated.

4th nest.—Three eggs much incubated.

5th nest.—Two newly hatched young, and one egg chipping.

The 6th and 7th nests were inaccessible, but a bird was sitting in each.

After carefully marking the eggs from nests 2, 3, and 4, I found that it was quite easy to sort out the clutches without making use of the marks.

Now, even supposing that the hens in nests 6 and 7 were sitting hard on empty nests, and had deposited their two eggs in two other nests (a most improbable supposition), there still remain fifteen eggs as the produce of seven hens; so that at least one hen *must* have laid three eggs.

May we not reasonably infer that the Swift not infrequently lays three eggs, as its alpine relative (*Cypselus melba*) is known to do?

The nests which I have examined consisted of a mass of feathers, a few straws, bud-cases, and blossoms from trees, fastened together with shining glutinous matter into a saucer or shallow cup. In one case this cup was built on to the top of a Sparrow's nest, and another was placed by the side of a Sparrow's nest containing young.

Young Swifts are extraordinarily unlike their parents, but, as they have already been described by White of Selborne and others, it is hardly necessary to do so here. One striking characteristic, which is very noticeable in the embryo, is the large proportionate size of the tibia as compared with the adult. The tarsus and claws are also well developed, while the featherless wings seem very small in proportion to the body. As far as one could tell, the hind claw in the embryo was opposed to the rest, and not directed forward as in the adult.

When the young leave the nest one or two are generally killed by striking the walls of the house. Sometimes, but more rarely, an old Swift is picked up stunned, but usually recovers after a time. Starlings often take possession of Swifts' nesting-places, but not without having to fight for them, and sometimes Starling and Swift will come headlong to the ground, grappling one another, in which case the Swift generally gets the worst of it.

We do not often see Swifts after the third week in August, and, though an occasional straggler may sometimes be seen as late as Sept. 1st, it is quite exceptional, and for the next eight months their dark forms and cheerful screams are absent from our skies.

PHOTO-TRAPPING: PURPLE HERONS AND SPOONBILLS.

By R. B. Lodge.

It was in 1896 that I described, in 'The Zoologist,'* a visit to a well-known breeding-place for Spoonbills in North Holland, and I then expressed a desire to spend a week in the attempt to photograph the adult Spoonbills. This wish was gratified, as far as the week goes, in 1897, but, though I exposed two plates on adult Spoonbills on their nest, both plates were found to be fogged and useless on my return home. In the same year I attempted the same birds in a Spanish lagoon, and failed, and I began to think that Spoonbills were not to be photographed. However, in my albums a blank page was left for them, and my determination was fixed to have another attempt. Not until this year has this been possible, and my blank page is now filled to overflowing.

A week was spent in the same "meer," and hopes were fixed on a new automatic electric photo-trap of my own contrivance; but directly I reached the colony I found it was too late to use it, as far as the Spoonbills were concerned. The eggs were hatched, and the half-grown young ones were walking about restlessly, and would certainly have sprung the trap before the arrival of the parent birds. Other methods therefore had to be resorted to, and the electric shutter was released by means of a string on to the switch from a hiding-place the other side of a narrow channel cut in the reeds, from which place, waist deep in water, I also used the tele-photo lens with good effect. Finding that the birds came much more readily than on any previous occasion, I took a whole-plate camera, and hid up with it about seven yards away from the nest, and got my boatman to cover me over with reeds. Here I soon had two splendid chances in a very short time. Once both the old Spoonbills and their three young ones were in front of me; the young birds, after teasing the old ones for food, would insert their beaks into the parent's throat, and there feed like young Pigeons.

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* Zool. 1896, p. 321.

All the adult birds seen had a curious mark on the throat, which, both in shape and colour, gave them the appearance of having their throats cut. I do not mean the orange gorget at the base of the neck, but where the head joins the neck is a mark the colour of dried blood, and just the shape of a gash across the throat with a knife. I do not remember seeing this described.

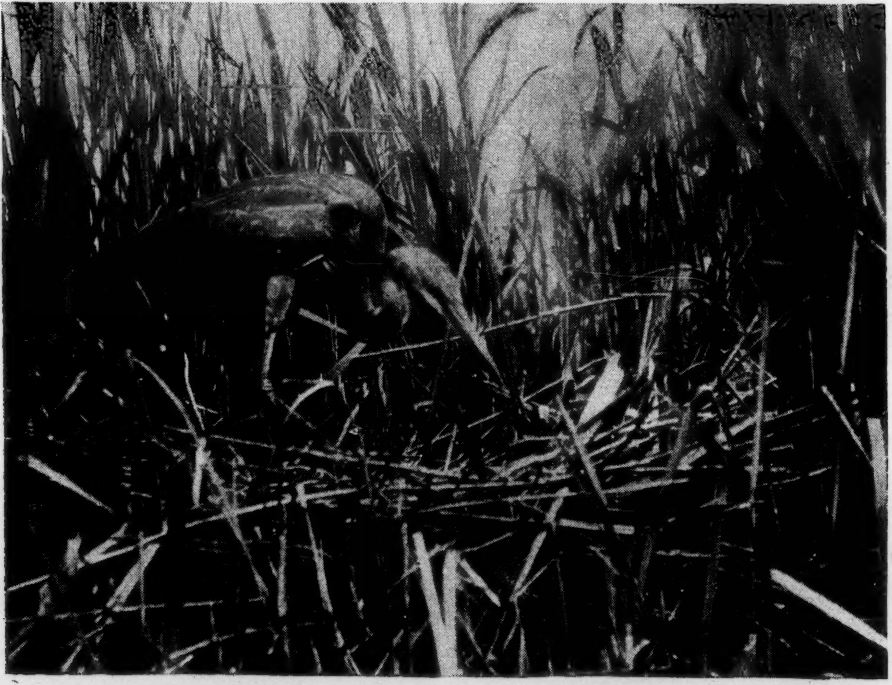
It was a splendid sight to see these beautiful birds alight at such close quarters, with lowered beak and legs, and a tremendous flapping of great white wings ; while the young birds kept up a continuous querulous "chipping," like chickens.

Purple Herons, as usual, were nesting in close proximity, and constantly visited their nests, to an accompaniment of their customary grunts and growls. They too had young, but not far away we found two late nests still containing eggs. Here I tried the photo-trap, but without success, the water being deep and the camera awkward to hide. Another nest was subsequently found better situated, and here we built up a platform of cut sedge and reeds, on which the camera was just raised above the water, and well covered with more sedge and wet water-weeds. A dry-cell battery was hidden with it, and wires carried round to the nest connected with a specially designed switch, on which it was hoped the bird would tread, and so connect the battery, and expose the plate. This was about 10 a.m., and on visiting it in the middle of the day, great was my delight to find the shutter had duly gone off. Looking at the nest, the first impression was that I had been lucky enough to photograph not the Heron, but a Marsh-Harrier in the act of stealing eggs ; for four eggs had been left, but we could see but three ; the nest was smeared with blood, and a dead reed which formed the lever of the switch was broken short off.

In connection with this state of things, the fact that we had disturbed a Marsh-Harrier from the adjacent reeds as we approached seemed rather significant and suspicious. However, a search revealed the missing egg in the water under the nest, and the conclusion was formed that the Heron herself had ejected the egg, breaking it in doing so, and also snapping off the reed.

Resetting the shutter, and covering all up, the trap was left again until after 6 p.m., when a second visit again found it sprung, and the plate duly exposed; while on a subsequent day—the last one of my stay—she came on again. The first Heron, I think I may safely say, to photograph itself with electricity, but probably not the last.

If this method succeeds with a bird of such extreme shyness and timidity as the Purple Heron, it should prove of great service in obtaining records of birds and animals hitherto impossible. Not only birds at their nest, but any bird or animal, large or small, diurnal or nocturnal, which can be attracted by a bait, or which habitually uses the same path or run, can now be photographed. Of course, for nocturnal animals the inclusion in the circuit of a flash-light, to be ignited by the same current which operates on the shutter, is indispensable.



Ardea purpurea automatically photographed by itself.

Besides the Purple Heron, the trap was tried at the nests of a Marsh-Harrier and a Great Crested Grebe. These attempts, from the difficulty there was in concealing the camera, were failures.

Before leaving England experiments were made with the trap at a Lapwing's nest, which were successful three times out of four, only so far as that the bird duly went on and released the shutter. This at first was uncovered and rather noisy, and the bird "jumped"; the fourth try, the shutter having been improved and covered in, was entirely successful. The Lapwing, however, this last time sat on the switch for a couple of hours, and completely exhausted the dry battery,—this contingency not having been allowed for. An automatic cut-off has now been made, and, after the release of the shutter, no more battery action can possibly take place, however long the switch is kept pressed down. The shutter, by the way, was made from my designs by Messrs. Dallmeyer, of Newman Street.

THE BIRDS OF GREAT YARMOUTH AND THE NEIGHBOURHOOD.

By Arthur Patterson.

(Concluded from p. 105.)

Sterna fluviatilis. Common Tern.—C. This species many years ago nested on Hickling Broad, and on many other parts of the coast, which it has since deserted. It is now most commonly observed leisurely migrating southward in August, following the coast-line in flocks, feeding on the "herring-syle," which may be seen flashing like myriad streaks of burnished silver at the surface of the water. Occasionally young birds may be seen, resting on the beach, fed by the old ones; three were observed thus tended, Aug. 19th, 1891.

S. macrura. Arctic Tern.—F. C. My experience of this species is, that it is in some years almost as plentiful as the preceding species. It follows the coast-line also in autumn, and in company with *S. fluviatilis.* Was unusually abundant in this neighbourhood in August, 1881, when many were killed. When on the wing, fishing, it is difficult, of course, to distinguish from the Common Tern.

S. minuta. Little Tern—N. U. Said to have formerly nested at Hickling, but had become rare in this county at that period, and has now quite deserted the Yarmouth district. It is occasionally seen on Breydon in autumn. Plentiful on Breydon, Aug. 1881. I saw several, Aug. 1900. It is a charming little creature, whose loveliness alone should ensure its immunity from destruction.

Xema sabinii. Sabine's Gull.—A. Two obtained on Breydon, immature male and female, Oct. 17th and 21st, 1881. A young male "consorting with Lapwings" was shot at Hickling, Oct. 6th, 1889 (Norf. and Nor. Nat. Soc.).

Larus minutus. Little Gull.—R. R. May be looked for after severe north-westerly gales. Was, prior to February, 1870, considered a very rare species: in that month a tremendous *easterly* gale blew a whole flock to the east coast. Over sixty were killed in Norfolk, the majority adults (Norf. and Nor. Nat. Soc. vol. iv. p. 410). A beautiful black-headed adult was shot at Hickling, April 2nd, 1888 (Connop Catalogue).

L. ridibundus. Black-headed Gull.—C. This species breeds plentifully in the Broad district, and is common at Yarmouth at all times of the year, becoming numerous on the mud-flats and at the harbour mouth in autumn. During severe weather flocks are seen hunting for floating edibles on the river in the heart of the town. Protracted frosts make them remarkably tame, when they swarm on the town refuse-heaps, and are easily decoyed into a net. A birdcatcher, in December, 1890, caught one hundred and thirty-seven in three days with a clap-net on the North Denes. Fifty-six were taken at one pull. The same bird-catcher captured fifty-three out of a flock on Feb. 11th, 1895. On Nov. 27th, 1895, hundreds were attracted to a field at Browston, near Yarmouth, manured with herring refuse, most of which they devoured. Local, "Kitty."

L. melanocephalus. Mediterranean Black-headed Gull.—A. An adult male was shot on Breydon, Dec. 26th, 1886; the first example recorded as met with in the British Isles. The wind was south-west on the day it was shot, and north-west the day before. It was identified by Mr. G. Smith, in whose possession it still remains.

L. canus. Common Gull. — C. Frequent on Breydon in all stages of plumage. More commonly seen off shore during rough weather, generally flying shoulder to wind. Local, "Sea Cob."

L. argentatus. Herring-Gull.—C. Common in late autumn, when fine adult birds may be observed leading the beach, north or south, according to the winds. Numbers on Breydon, Nov. 1900.

L. cachinnans. Mediterranean Herring Gull.—A. A male of this species shot on Breydon, Nov. 4th, 1886. The first recorded British example (Norf. and Nor. Nat. Soc. vol. vi. p. 417).

L. fuscus. Lesser Black-backed Gull.—C. Common, more especially in immature plumage.

L. marinus. Greater Black-backed Gull.—C. Common on Breydon all the year round. A considerable number there all through the summer, mostly immature, with a few adult non-breeders. Blotched individuals, assuming the mantle, not unfrequently seen. Birds of the year (*local,* "Grey" Gulls) numerous during herring fishing and in winter along the shore, at which time there is in the early morning a movement southward, and again at eventide, northwards.

L. glaucus. Glaucous Gull.—N. U. A regular "hard-weather" species. Numbers brought in by fishing-smacks, Jan. 1881; I know of twenty-seven offered for sale in one lot, of which seven were fine adult birds. Several have been killed in the neighbourhood, odd birds being met with in ordinary winters. Example killed at Caister, Feb. 1899.

L. leucopterus. Iceland Gull.—R. An example killed in Nov. 1852 (B. of S.). A second obtained at Caister in Nov. 1874. Two others at Yarmouth and Scratby, respectively, Dec. 6th and Dec. 28th, 1892. I saw, and crept to within a few yards of, one near Breydon walls on Jan. 14th, 1899; it was subsequently shot. On May 3rd, 1899, I observed a white Gull, which I believed at the time to belong to this species. It remained with other Gulls two or three days, and was unmolested; but was afterwards shot, and identified as a variety of *Larus canus.*

Rissa tridactyla. Kittiwake Gull.—F. C. A peculiarly marine species, spending much time far out at sea. Is well known to the herring fishers. It inshores in stormy weather, and appears sometimes to perish in heavy gales, after which I have occasionally picked up several. On Feb. 16th, 1890, I found no fewer than thirty, with sixteen dead Razorbills at intervals, in a walk along the beach. It may be identified at sea by its erratic flight. Is not so common locally as formerly.

Stercorarius catarrhactes. Great Skua.—R. R. A rare bird on our coasts. Messrs. Paget state that four were shot in the Roads, Oct. 7th, 1827. Mr. Stevenson enumerates several for Yarmouth (B. of N. vol. iii. p. 346). One at Yarmouth, Oct. 3rd, 1881.

S. pomatorhinus. Pomatorhine Skua.—R. R. This species is the most frequent of the Skuas on the east coast of Norfolk. Several have been recorded during the century during gales, chiefly in October. Many were met with in 1874; after a heavy gale on Oct. 20th, "one game-dealer had thirty Skuas at one time, probably nearly all Pomatorhine" (B. of N. vol. iii. p. 350). A large migration in 1879, which Stevenson calls "the great ornithological feature" of that year. Several seen and obtained, Oct. 1881. I found the remains of one on the beach in Nov. 1892. Local, "Shyte-awk," "Boatswain," and "Molberry."

S. crepidatus. Richardson's Skua.—R. R. Messrs. Paget say that "both this, and its young, the Black-toed Gull, have occasionally been shot." Most are immature birds.

S. parasiticus. Buffon's Skua.—R. R. An occasional visitant. Stevenson (B. of N.) records several local examples. A fine male specimen was shot on Breydon in Oct. 1890, which on being placed on the floor of the punt vomited several live earthworms.

Alca torda. Razorbill. — C. Not uncommon in the Roads during the autumnal herring fishery. In my younger rambling days I observed that drowned examples were frequently washed ashore after continuous easterly gales. Of late years it has become comparatively rare, its place being taken by the Guillemot, which then was not so commonly stranded. Local, "Wil-duck."

Uria troile. Common Guillemot.—C. Occasionally abundant in the Roads; also on the herring fishing-grounds. Have known it hooked from the piers by amateur fishermen, by whose baits it has been attracted, and have obtained specimens that have been entangled in the meshes of 'longshore drift-nets. I have frequently seen dead or exhausted birds toppled ashore during easterly winds. My attempts to rear several have always failed; indeed, healthy birds, incarcerated in aviaries, seldom live for any length of time. I have occasionally met with the ringed or bridled variety. Local, "Wil-duck."

U. grylle. Black Guillemot. — A. Two recorded for Yarmouth (B. of N. vol. iii. p. 280). The first was picked up on the beach at Caister; the second shot in the winter of 1878-9.

Mergulus alle. Little Auk.—N. U. "Occasionally shot in Roads" (Paget). Is looked upon as a mere straggler, although it has been occasionally "struck" by severe gales, when numbers have been washed ashore or blown inland. An unusual fatality occurred in January, 1895. Three hundred and two were recorded for the county. I picked up two or three at the sea-line, but Yarmouth did not share in this visitation to the same extent as Blakeney and Wells in north Norfolk.

Fratercula arctica. Puffin.—R. R. Not a common bird on the Norfolk coast. "Some have been seen by Mr. Southwell on Yarmouth Roads in summer. . . . They are not (however) nearly so common as might be expected," considering the nearness of Flamborough Head, a favourite nesting-place of the species (Norf. and Nor. Nat. Soc. vol. iv. p. 415). I have rarely picked up dead examples on the beach. Local, "Sea-parrot."

Colymbus glacialis. Great Northern Diver.—R. R. Messrs. Paget observe that specimens of this bird were "occasionally shot on Breydon; the young bird is more common." This description holds good to-day, but it is always scarce, and the adult in summer plumage has never been obtained in Norfolk.

C. adamsi. White-billed Diver. — A. An example in winter plumage obtained at Lowestoft in 1852. Mr. E. T. Booth shot a specimen on Hickling Broad in December, 1872 (Norf. and Nor. Nat. Soc.).

C. arcticus. Black-throated Diver.—R. An unusual winter visitor. Three or four recorded for Breydon and neighbourhood, two of them in March, 1871, another in November, 1880. The immature bird may be not seldom mistaken for that of the red-throated species, but is larger, and has a whiter neck.

C. septentrionalis. Red-throated Diver.—F. C. Our commonest Diver. Messrs. Paget record it as "common on Breydon." It is now only occasionally observed there, but is often seen off the beach, generally in late autumn. Mr. E. T. Booth observed hundreds during the last week of October, 1872, in close proximity to the herring-fleet outside the Cross Sands. One with full red throat shot, Sept. 15th, 1897. Local, "Sprat-loon."

Podicipes cristatus. Great Crested Grebe.—C. At one time this beautiful bird was becoming scarce on the Broads owing to the demand for its breast feathers. It has now, however, once more, thanks to careful preservation, become fairly common. I have observed it in mid-winter off shore, but its return to Fritton Lake is not until March, or when the frost breaks up. In June, 1896, one was hooked on Ormesby Broad.

P. griseigena. Red-necked Grebe. — R. "Three shot in

January, 1828" (Paget). Have occasionally met with it in winter on sale in the market. Three more shot, Jan. 9th, 1891, when the migration extended to other parts of the east coast; and others in the great migration of 1865.

P. auritus. Sclavonian Grebe.—N. U. I know of no local occurrence in the full summer plumage, but it is not seldom brought to market in winter. Immature examples have been met with on Breydon.

P. nigricollis. Eared Grebe.—R. Rarely shot on Breydon or the Broads in Messrs. Paget's time, but several are recorded in the 'Birds of Norfolk,' mostly in spring. Has probably nested on the Broads. An example shot in this neighbourhood, Oct. 7th, 1899.

P. fluviatilis. Little Grebe.—C. More frequently observed and shot in late autumn and winter. During severe weather takes to the lower reaches of the rivers and Breydon. Several there, December, 1899. Six brought to market on Dec. 16th, 1899. Probably migratory additions from more northerly counties before sharp frosts. Local, "Dob-chick."

Fulmarus glacialis. Fulmar.—R. R. Generally met with in winter. Has been occasionally brought in by fishermen. I have picked up dead examples on the beach, which I incline to think have been thrown out of the herring-nets. "Occasionally shot or caught in the Roads" (Paget). Less frequent of late years (B. of N. vol. iii. p. 374). Mr. Gurney has a barbed fish-hook, 2½ inches long, with 28 inches of twisted cord, which was taken out of a Fulmar Petrel caught off Yarmouth in November, 1885.

Puffinus major. Great Shearwater. — A. An example was picked up on Caister beach on Dec. 22nd, 1892; and another was shot, in November, 1898, at Lowestoft.

P. anglorum. Manx Shearwater. — A. Very rare. Mr. Lowne had one from Breydon, Sept. 4th, 1883. Another procured there, Sept. 15th, 1891.

Oceanodroma leucorrhoa. Fork-tailed Petrel.—R. R. Messrs. Paget mention "a specimen found on the beach, Dec. 5th, 1823." Several have been recorded since. It has generally occurred in rough weather. One shot on the beach, Jan. 6th, 1891; and another taken alive in the town, Oct. 8th, 1898.

Procellaria pelagica. Storm-Petrel. — L. L. In the days (prior to 1876) when herring-luggers landed their catches on the beach, in the huge "carrier" boats, and when much refuse was thrown overboard, this Petrel was common, hundreds at times visiting the neighbourhood. The fishermen amused themselves by knocking them down with osier wands as they followed the herring-milts trailed behind the boats on pieces of string. In November, 1824, between two and three hundred, according to Messrs. Paget, were shot after a severe gale. Mr. E. T. Booth mentions seeing numbers off shore on November, 1872. It is now seldom seen except in exceptionally severe and continued gales. Mr. J. H. Gurney received one from Winterton Lighthouse on Dec. 9th, 1899.

SLOUGHING IN SERPENTS.

By Gerald Leighton, M.D.

The process, common to all reptiles, of periodically casting off a "slough" is a very interesting one to watch, and can best be observed in serpents. It is not often the good fortune of the observer to be able to see it in natural conditions, though I have encountered several Adders engaged in the act; but in serpents in captivity the whole process can be studied with ease and accuracy. In books which touch on the subject three statements are to be found, which, in my experience, are inaccurate, or at any rate only partially true. It is said, in the first place, that the slough is cast once every year; secondly, that the reptile often makes a meal of the cast-off slough; and, thirdly, that the slough is cast entire (*i. e.* in one piece) when the reptile is in good health, but in several pieces if the animal is out of condition. It is quite possible that various species exhibit individual peculiarities in this matter, but in the case of British reptiles none of these statements are quite accurate. In the first place, it is usual for both Adders and Ring-Snakes to cast their sloughs three, four, or even five times in a season. The first sloughing takes place immediately after the winter hibernation is over, and the process is repeated at intervals of six weeks or two months. The same remark applies to the Slowworm (*Anguis fragilis*). Secondly, I doubt whether any one of the three species mentioned ever swallows the cast-off slough—at any rate, those I have kept have never done so. It is no doubt true that some amphibians do this, and probably this accounts for the idea that serpents act in a similar manner. The third point is perhaps the most interesting, and it is that to which I wish specially to draw attention in this paper. What determines whether the slough comes off whole or in pieces? To answer this question it is necessary to understand the nature of the process. There are two distinct stages in the act of sloughing.

The first is an active *physiological process* on the part of the serpent, as the result of which the external covering is separated from the true skin. Prof. Packard describes this separation as being due to the growth of fine temporary cuticular hairs. Thus loosened, the slough rapidly becomes dry, and is ready to be cast off. The second stage, or the casting off, is a *mechanical process*, by which the serpent endeavours to rid itself of what is now no longer a part of its anatomy. This is effected by continuous rubbing against any convenient surface, the side of the cage in the case of captive snakes. The result of this rubbing, as far as the slough is concerned, depends, in my opinion, on the simple factor of whether the serpent is in a position to rub off both sides of the slough evenly—that is to say, if the reptile can get pressure evenly exerted on both sides of the body—by creeping through grass, or in some other way—the slough will peel off whole, being turned inside out in the process; but if, on the other hand, any projecting point should come in contact with one side of the slough, the latter, being very delicate, will be torn, and the slough cast in pieces. In very young, and therefore small snakes, the slough comes off very readily, and generally entire; but in older and larger specimens I have found it the exception rather than the rule for this to occur, and the slough is usually in pieces. This is quite independent of the state of health of the snake, a matter which is, moreover, somewhat difficult of diagnosis, unless the reptile is suffering from canker. I have made a point of observing this sloughing in reptiles in various zoological collections, and invariably have seen the sloughs of the larger serpents in pieces in the cages. Anyone can observe it at the Zoo. It is particularly noticeable in the Pythons; and I now append a series of notes made by Mr. W. J. Clarke, of Scarborough, on the frequency and character of the sloughings of one of his Pythons:—

Python molurus.—Sloughing in confinement (W. J. Clarke, Scarborough).

"I received the Python on Sept. 7th, 1897. Three weeks later I found one morning that it had shed its slough, but, not expecting this, made no notes. Python now measured 6½ ft.

"1. On Nov. 20th, 1897, at 7 p.m., Python entered the water in its zinc bath. Remained there continuously till 11 p.m. on

Nov. 26th, when it shed slough in two large pieces in the water, and then left the bath.

"2. On Jan. 6th, 1898, at 3 p.m., Python entered water, and remained till 3 p.m. on Jan. 13th, when it cast slough in several pieces, and then left water.

"3. On Aug. 10th, 1898, Python again entered bath; remained without any intermission till 11.30 p.m. on Aug. 19th, when it left the water. At 11.40 it commenced rubbing its head forcibly on the felt which lines its case, frequently turning its head sideways to exert pressure upon the side of the jaws. When it had got as far as the nostril it gave two sudden and forcible expirations—not an ordinary hiss, but more like a sneeze, apparently to clear the loose skin from the inside of the nostrils; at all events it had this effect; then continued rubbing off the slough. At 11.48 the slough was completely free from the head above and below. At 11.52 I removed the bath out of the cage, as it seemed to have too little space. On being thus disturbed it ceased rubbing till 12.10, when it commenced to crawl slowly round the cage, pressing itself closely into the corners and along the sides. By 12.37 it had turned back two feet of slough, and at 1 a.m. three feet. At 1.30 a.m. the tip of its tail came away from the slough, which on this occasion was shed entire, but with one or two rents in it. During the last half-hour I assisted the process by allowing the Python to crawl through my partially closed hands.

"4. On Nov. 6th, 1898, Python entered water. Remained continuously till 24th, when it cast slough during the night.

"5. On Feb. 16th, 1899, Python appeared soon likely to slough, so I introduced its bath. It entered at once, but only remained a few hours, and kept on entering and leaving the bath until Feb. 25th, when sloughing commenced. As the slough was dry it did not readily peel off, and the process was only partially completed. The Python then entered the water, and remained till Feb. 28th, when it emerged and cast the rest of the slough. (On Feb. 27th it was observed to remain under water for seven and a half minutes once without raising its head for breath.)

"6. On July 18th, 1899, Python entered water, and stayed till July 28th, when it cast slough in water. The actual sloughing occupied one hour. (Cast whole, with many rents in it.)

"7. On Oct. 12th, 1899, Python entered water, and stayed till Oct. 26th, when it left water, and cast slough in several pieces.

"8. On Dec. 30th, 1899, Python entered water, and on Jan. 1st, 1900, cast slough in water in many small pieces.

"9. On March 24th, 1900, Python showed signs of sickening for sloughing, but refused to enter water. It tried to slough on April 2nd, but could only get off the scales on the belly. I accordingly fastened the Snake in the bath, where the rest of the slough came away on April 5th.

"10. On May 21st, 1900, Python entered water, staying till May 28th, when it left water, and cast slough in three large pieces.

"11. On Aug. 23rd, 1900, Python entered bath, stayed till Aug. 31st, when slough was cast in two pieces in the water.

"12. On Nov. 15th, 1900, Python entered water, stayed until Nov. 25th, casting slough in water in four pieces. The Python now measures just under 8½ ft. in length."

The foregoing admirably careful observations by Mr. Clarke show that his Python sloughed twelve times in three years, usually casting the slough in pieces, though in good condition. The term "sickening for sloughing" means the symptoms seen a few days beforehand, *viz.* roughness and darkening of the skin, refusal to take food, disinclination to move, and dimness of the eyes.

NOTES ON THE EGYPTIAN JERBOA (*DIPUS JACULUS*) IN CAPTIVITY.

BY GRAHAM RENSHAW, M.B.

THE immense number of species of animals which are now kept as pets almost defies enumeration, and it is difficult indeed to select for special notice any single animal; for all the others compete with it in claiming the attention of those zoologists to whom mammal or bird, reptile or fish, is more attractive in the living state than as a stuffed skin or mounted skeleton in a museum case. The furred and feathered captives of to-day range from the schoolboy's Rabbits and White Mice, Pigeons and Canaries, to the Burchell Zebras and White-tailed Gnus, the Kangaroos and Emus of wealthy acclimatisation societies; and half-way between these extremes one may place various "out-of-the-way" pets—by no means ordinary domestic animals, yet also by no means unobtainable—such small specimens as Armadillos, Agoutis, Phalangers, and Wallabies.

Amongst this assemblage of "out-of-the-way" pets is included a pretty little rodent rapidly and deservedly advancing in popularity—the Egyptian Jerboa (*Dipus jaculus*). Not only does its tiny form interest the scientific naturalist, with its quaint little body perched on an absurd pair of stilt-like legs whose disproportionate size contrasts strangely with the almost microscopic proportions of the fore limbs; but its beaming eye, vivacious manners, and odd bird-like gait (now running like a Rail, and now hopping like a Sparrow) endear it also to the general public. Having for some considerable time possessed examples of the Egyptian Jerboa, I have had many opportunities for studying their behaviour in captivity, and perhaps the collected results of the observations may interest others besides myself.

The Egyptian Jerboa measures about 14¾ in. from the snout to the tip of the tail, exclusive of the terminal tuft of hair. The colour varies somewhat: in large well-grown specimens it is sandy, but I have noticed that in small Jerboas it may have a distinct greyish tinge. The tail is brownish, tipped with black and white.

When standing "at ease" the Jerboa uses its tail as a kind of third leg, this tripod arrangement recalling similar habits practised by other mammals widely differing from the Jerboa—such as Kangaroos or Wallabies, and perhaps also the huge extinct Megatherium of South America. The Jerboa presses its tiny fore legs close to the chest, and the body projects forwards. When moving this little animal employs one of two gaits: (1) a quick run, each leg being moved alternately; and (2) a series of tremendous leaps, the long tail being held out straight behind, as if to counterbalance the forwardly directed head and body. I well remember a fine male, which I still possess, escaping from his prison, and the great rapidity with which he bounced along over a wide lawn, as if made of animated india-rubber, the tiny fugitive progressing at a lightning speed that rendered pursuit hopeless. His final recapture was effected by strategy.

Jerboas are usually stated to be nocturnal; so no doubt they are to a large extent, but by no means entirely so. They are at any rate also crepuscular, if not diurnal, my own animals being lively at all hours, retiring to rest irregularly for a longer or shorter interval. When asleep they repose either huddled up in a furry ball (head tucked in and tail coiled round them), or else lying on one side. The latter position was rather horrifying at first, suggesting that the Jerboa had departed this life; however, a dead Jerboa either lies flaccid with limbs extended, or else rolls over on its back, the long legs sticking up in the air. These animals are lethargic in wet and foggy weather, and sleep much later in the day than when it is dry and warm. On rousing up for the evening the Jerboa frequently opens its eyes, and remains motionless in a dozing semi-somnolent condition for perhaps half an hour or an hour before becoming fully active. It then begins to clean itself with great care, smoothing its fur, and paying special attention to the terminal tuft of the tail, the hair of which is absurdly parted down the middle in the neatest possible manner. The Jerboa also frequently stretches itself in the most amazing fashion, extending itself to the utmost, so that, as it lies on its side, the long hind legs form almost a straight line with the body. The next instant the little contortionist flexes its body, the long legs projecting in front of its muzzle as rigidly as a moment before they were extended backwards. Food is the next consideration: the Jerboa begins to run about with remarkable nimbleness and lightness, like some wee brown gnome or "brownie" (*literally*, a "brownie"), ever and again abruptly stopping to examine some object. Oats, corn, millet-seed—any dry food is welcomed, the grains of food being clasped in the tiny fore paws, and conveyed to the mouth in true rodent fashion. Green-stuff is also taken freely. Although probably, like the Giraffe, the Eland, and the Gemsbok, the Jerboa has often, in its own African deserts, to go without water for long periods, it drinks freely when it has the opportunity, and I have frequently seen my own animals drink, scooping up the water with the fore paws, and conveying it to the mouth so quickly that at first glance the animal seems to be lapping the water like a Dog.

Jerboas are very playful: if their cage is carpeted with sand, they will stretch themselves on it with great glee, and attempt to burrow in it, ploughing up the sand with their muzzles. They also have a mischievous habit of nibbling woodwork, and on one occasion a pair of these animals utterly ruined a small bird-cage given to them for a sleeping apartment by demolishing both floor and back, an enormous hole being gnawed in each. One Jerboa, indeed, which was recently addressed to me, I never got, for in transit the industrious prisoner nibbled his way out to freedom, doubtless to the astonishment of the railway officials. Twigs and branches with the bark on are quickly stripped bare; in this respect these rodents are fully as destructive as Budgerigars or Parrots. Jerboas climb well, running quickly up wire-netting, and jumping off recklessly on to the floor from a considerable height; I once lost a nice female from a compound fracture of the leg, supposed to have been caused by this habit. She persisted even after the limb was broken in scrambling up the wires on one leg, and did not die for at least a week after the injury, eating and sleeping well in the interval. Jerboas are very tough; the male I now possess once fell through a hole in the floor of a loft upon the concrete pavement of the room below, from a height sufficient to have seriously injured, if not killed, a human being. Nevertheless, though his muzzle was covered with blood when I picked him up, causing very laboured respiration for some time after, on revisiting him about three hours later he had already recovered, and was as active and lively as before. This is the more remarkable, as a female which was killed by accident died in three minutes, the skull cracking like an egg-shell, and the animal being convulsed all down one side.

Solitary Jerboas remain silent for weeks together, but a pair during courtship repeatedly utter a curious croaking noise, sitting facing each other with their depressed muzzles in contact. I have not yet succeeded in breeding these little animals.

The above are the results of observations conducted during the past ten months on captive animals, well-fed and well-housed, with abundance of room for exercise, and good bedding. The list of specimens is as follows :—

(1) Adult female, purchased November, 1900.—At first lively and feeding well, this Jerboa soon became somnolent and stupid, probably owing to the continued damp weather, with almost total absence of sun. It uttered no sound, and was very gentle, never attempting to bite. This Jerboa died in the winter of 1900–1.

(2, 3) Adult male and female ; a fine well-grown pair, purchased Jan. 14th, 1901.—The male (still living) was a remarkably fine animal, always more active and more easily roused than the female, who, I think, must have been an old animal, as her partner paid her little attention. The male was a public character, who achieved considerable notoriety ; for, having been taken to exhibit at a local bazaar, he distinguished himself by escaping from his custodian, and remained triumphantly behind the wainscoting of an adjacent chapel for about an hour and a half, scraping with provoking and very audible diligence at the mortar of the wall. After several fruitless attempts he was recaptured, and again figured in public, to the great benefit of the funds, very many persons coming to see the wonderful "Rat on stilts." Both animals delighted to gnaw holes in an old curtain, to which they had access, and burrowed amongst its folds with infantine delight.

(4) A young female, successor to No. 3.—The male was much attached to this animal, paying her much attention. Unfortunately

she died as a result of a broken leg, probably received in falling a considerable height from the sides of the cage. She was of a remarkably lively and frolicsome disposition, pattering about over the floor of the cage with the nimbleness of a Sandpiper.

(5) A young female.—Very small and poorly coloured; a remarkable greyish tinge showing on the fur.

(6) Adult female (successor to No. 4).—A handsomely marked specimen, rich dark fur in contrast to No. 5. The male seemed to like her well enough. It was hoped the pair would have bred. Unfortunately she was found dead one morning, though apparently in perfect health the day before. No cause of death was assignable. The male has survived all his wives, and is as lively as ever.

In concluding this article, I cordially recommend the Egyptian Jerboa to any naturalist in want of an out-of-the-way pet. Of convenient size, gentle disposition, engaging manners, and quaint shape, this little animal can be obtained at a very moderate price (say from four to seven shillings) of many London dealers, and is easily kept on crushed oats, millet-seed, or similar dry food. It does not require artificial heat save in the bitterest weather, provided it be kept indoors; it is neither delicate like a Marmoset, uncertain like a Ferret, noisy like a Cockatoo, nor vicious like a Budgerigar. Let the Jerboa have its food and cage perfectly dry, damp and especially fog being carefully avoided; see that the drinking-vessel is accessible, and give the animal plenty of clean dry hay, from which it will itself gnaw fragments to form its diurnal couch, and *Dipus jaculus* will live long and happily to delight the heart of its owner with its odd ways, lively movements, and docile temperament—a rodent Kangaroo, a mammalian Sparrow, and a vertebrate Sandhopper all rolled into one.

OBITUARY.

ELEANOR A. ORMEROD.

By the death of Miss Ormerod there has passed away a notable Englishwoman. She was not only recognized as a naturalist—being an entomologist of no inconsiderable attainment—but she was distinguished in the higher sense of rendering her science a practical value for the good of humanity. We know in many cases the absolute impossibility of bringing zoology into the domain of our national economy; we also clearly see the advisability of not seeking to do so on insufficient grounds; but it was the great work in the life of Miss Ormerod that she made her favourite science a blessing to the community. Unendowed, except by her singleness of purpose, she took up a work which appertains to a non-existent governmental department, and cheerfully devoted her talent and much of her means to the service of the agricultural and trading community. That this is no hyperbole, and that entomology may be made a factor in the welfare of our commercial life, is proved by the notices of her death in papers which have reached us, not only such as represent the agricultural interest, but others bearing such names as 'Mark Lane Express,' 'Meat Trades Journal,' 'Boot and Shoe Trades Journal,' &c. She may be said to have consecrated the study of insects in the economic and commercial instincts of our national life.

The lady who thus brought natural history to the aid of the democracy was well-born and carefully nurtured. She was the third and youngest daughter of the late George Ormerod, D.C.L., F.R.S., &c., the author of the 'History of Cheshire,' who belonged to the Lancashire branch of the Ormerods of Ormerod. Her mother was the eldest daughter of John Latham, M.D., F.R.S., Fellow and sometime President of the Royal College of Physicians. She may thus be said to trace her parentage from an aristocracy of intellect. Born on May 11th, 1828, she had

Yrs very truly
Eleanor A. Ormerod

reached an age of seventy-three years. As a woman, Miss Ormerod maintained the potentialities of her sex by being the first lady member admitted as a Fellow of the Royal Meteorological Society, and we believe also of the Entomological Society; while she still further carried the standard by being the recipient of the degree of LL.D. of the University of Edinburgh, for the first time a female distinction in the Scottish capital.

It is, however, in her twenty-four Annual Reports that the work done can be properly estimated. Farmers, agriculturists, and others recognized her as the authority to whom to apply for advice as to combating, if not overcoming, the plagues of noxious insects. An entomologist reading these Reports in a purely technical spirit might sometimes mutter "compilation," but this they never were, except in the sense that the sum of all human knowledge is a compilation. As a real student, she sought the best authorities; as an honest woman, acknowledged the sources from which she had obtained her information, and there that matter ended; her advice as to practical endeavour was her own, based on a wide experience, and in this sense compilation might as easily be charged against every historian. To know what has been done is the object of the publication of our annual 'Zoological Record,' and to have little knowledge of it is the weakness of weak zoologists.

The death of Miss Ormerod and the termination of her gratuitous services raises the whole question as to whether the time has not arrived for the appointment of a governmental bureau, where these matters—of vital interest to agriculture—should be entirely dealt with. America has long led the way in this enterprise, and we may eventually live to see entomology recognized as one of the most beneficent sciences. When this takes place the name of Miss Ormerod will be remembered as that of the pioneer of the movement, and as one who approached her subject with the grip of a man and the love of a woman.

Another writer who had most intimate relations with the deceased will now add some personal recollections.

(Ed.)

It has been thought curious that a lady should take up agricultural entomology, and not only dabble in the science, but practically make it her own, as Miss Ormerod has done, so far as this country is concerned. The beginning was undoubtedly example and precept. Dr. George Ormerod, as well as his brothers and ancestors, had been acute observers and practical workers in various fields of science; the same may be said of his wife and of her forbears. Observation of the habits of insects with patient interest was one of Miss Ormerod's earliest recollections. With her, interest was centred in life and habit, not in the making of collections.

As she grew to womanhood the duty fell to her of overseeing the farm and park-lands constituting her father's estate at Sedbury, on the Wye. The recollection of the beauty of Sedbury Park was a constant pleasure; and perhaps there was in it something of a family pride. She seems to have assumed practical management in every branch, and to have entirely won the confidence of those under her orders. She acquired a working knowledge of agriculture, made more thorough and accurate by the habit of intelligent, painstaking observation of little things in early years. Thus was entomology united to agriculture. Opportunity was abundant for observing insect depredation and experimenting for remedy, and the habit was formed of investigating life-history with a view to discovering the vulnerable point of attack, and of seeking hidden causes for visible effects. She became the counsellor of those under her at home, and it was an easy and natural transition to counsel practical farmers farther afield as help was sought.

At her father's death, she and her sister removed to Isleworth, where, in 1877, she determined to publish a few Notes of Observations on Injurious Insects; this was given to numerous correspondents, and was followed next year by a Report of the attacks of the year, with free quotation (carefully acknowledged) from those who had enquired and experimented with remedies. The Reports became Annual, grew in bulk and authority, and soon determined what was to be Miss Ormerod's future life-work.

It was no *dilettante* work, but involved concentrated application and energy. On various occasions an amanuensis was tried, but unsuccessfully; the only help in correspondence and editorship until the closing years was that of the dearly loved sister, so gifted as an artist—her other self—who died in 1896, and whose death cut away one-half of the light of the life that was left.

With Miss Ormerod correspondence was not perfunctory or official. Extreme and dignified courtesy—perhaps it would be called old-fashioned courtesy—marked her every action and word. Every enquiry (and many were concerning attacks already treated of in the published Reports again and again) would receive full and detailed reply. When on one occasion advised to minimise labour by enclosing a printed account of the remedy, "with Miss Ormerod's compliments," she derided the suggestion—it was not in that manner that her connection had been built up.

On the subject of payment she was very sensitive: payment would be tendered her for official duties, for evidence in law cases; but she would have none of it. Her publications, besides taking time, must have been a considerable item in annual expenditure; they were given to all who had helped her in however small a degree, as well as to scientific colleagues in this and other countries. "If my correspondents thought I was making money out of them, do you think they would continue to help me?" she would ask. Her leaflets upon special subjects were given away by hundreds of thousands, with hearty thanks to those helpers who would intelligently distribute them.

Fourteen years since, during return, somewhat overwrought, from an official meeting, a street accident occasioned an injury which was followed by lameness and almost constant physical suffering. She was never in strong health, and this was a shock to the whole system. "Sometimes," she said, "I lie awake at night wondering whether I can live through the pain until the morning." She not only lived through it, but bravely worked through it day after day, that the farmers whose interests were so near her heart might not suffer from her neglect.

Miss Ormerod valued the honours that were bestowed upon her by scientific societies; but the reason for appending them all on her title-pages was not vain-glory, but lest any should feel hurt by being omitted. She greatly appreciated being elected the first lady member of a learned Society; but what was felt to be the great honour of her life was the conferring upon her by

Edinburgh University of its LL.D. degree. She received numerous medals of honour in recognition of her services to science, and amongst them perhaps those most esteemed were that of the Société d'Acclimatation of France, and the gold medal of the University of Moscow. There is something tangible about a medal; it can be shown to interested friends, and incidents connected are recalled and related. Towards the close, as a consequence of the special illness, there were times of depression, when fears came that she was forgotten, and her life's work had been of no avail. On one of these occasions the sight of the collection of medals with their inscriptions served as a distinct restorative to a more cheerful view of life.

"There's a many will miss her; she was a good woman," said one of her working-men neighbours. Her kindness and courtesy to those about and around her have bound her to them in affectionate regard.

(T. P. N.)

NOTES AND QUERIES.

MAMMALIA.

CHIROPTERA.

The Whiskered Bat in Oxfordshire.—A Whiskered Bat (*Vespertilio mystacinus*) flew into one of the rooms here on the night of July 19th last. For several nights numbers of moths had been flying into the room, attracted by the lamp, and numbers of others were continually fluttering about outside. On several occasions I noticed two or three Bats flying backwards and forwards just outside the window, apparently in pursuit of the moths. Probably the Whiskered Bat was one of them. This Bat has been recorded from Godstow, near Oxford, but I had not previously met with it in the north of the county. Mr. Oldfield Thomas kindly confirmed my identification of the specimen.—O. V. Aplin (Bloxham, Oxon).

Bats carrying their Young.—On Sunday afternoon, the 7th July, a young Bat fell out of its home above our hall-door porch, and lay on the steps until evening. I placed it in a cardboard-box beside me, where it remained feebly squeaking as I sat with three other members of our family at dusk, when the elder Bats began to come out. They soon discerned the lost young one, and six or eight of them flew round and round us so closely that I turned it out on the gravel-walk about a yard from where I sat, when they continued to hover round it very closely. Anxious to witness its removal if possible, I placed it a little farther from us, and after more indecision one of the Bats alighted on the ground, and spread itself over the young one. I then covered it with a butterfly-net, and afterwards with a glass case, but, finding it did not move, I examined it without any covering for some minutes. Thinking it could not carry but intended to stay with the young one, I gently touched it, when it flew with its treasure into the shelter of a neighbouring group of trees. — R. M. Skipworth (Owmby Mount, Searby, Lincoln).

AVES.

Lesser Redpoll nesting in Sussex.—On May 4th, 1901, a nest of the Lesser Redpoll (*Linota rufescens*) was found by Mr. Arthur Byatt, of Midhurst, Sussex, in a small fir-tree, about fifty or sixty yards from the river Rother, at a height of from twelve to fifteen feet from the ground. When found it contained three eggs, of which one was taken at the time. The birds were watched and identified, and it was intended, when the full clutch of eggs had been laid, to take them, substituting small eggs of the Linnet for the Redpoll to hatch out, and then subsequently, when the birds had flown, to remove the nest for preservation. But on visiting it a week later (for the purpose of substituting Linnets' eggs as mentioned), the remaining two eggs were gone, as was also the lining of the nest, which consisted of vegetable down. There was no evidence of broken eggs anywhere on or around the tree, no signs of other visitants, and a Thrush's nest in the adjacent tree, low down and hard to overlook, was untouched, increasing the improbability of boys having found the Redpoll's nest, as their wont is to pull out every nest they can find, and to wantonly destroy or carry off every egg they can lay their ruthless hands upon. The theory of a passing Jay or Jackdaw or Magpie having carried off the eggs is hard to reconcile with the fact that the lining of the nest was gone. Mayhap the old birds may have removed it to line a new nest subsequently to the eggs being taken from the old one. It is believed this is the first recorded instance of the Lesser Redpoll's nest having been found in Sussex. Kent, Surrey, Hants are counties mentioned, but Sussex is not, as far as the books consulted may be taken as covering the ground. To revert to the wanton destruction of nests and eggs and young of birds by the ordinary boy nester, I may mention that recently Mr. Arthur Byatt, noticing a hole in a tree mudded up, remarked, "No Nuthatch has done that; some boy has closed it to prevent the birds sitting." He climbed up, removed the mud, was unable to enlarge the hole itself, but, finding the wood thin below it, made a counter opening some nine inches beneath, and dragged out from beneath a lot of rubbish, evidently pushed in through the original opening, six dead young ones of the Green Woodpecker.—C. Eastwick-Field (Hurst House, Midhurst, Sussex).

Common Roller in Sussex. — A Roller (*Coracias garrulus*) was shot on June 2nd at Ninfield, near Sidley, Bexhill, Sussex. The bird was taken to Mr. G. Bristow, of Silchester Road, St. Leonards-on-Sea, for preservation.—Thomas Parkin (Fairseat, High Wickham, Hastings).

[Two other specimens of this bird, obtained in Sussex, have recently been recorded in these pages. One procured on Sept. 24th, 1897 (Zool. 1897, p. 469), and the other on Oct. 12th, 1898 (Zool. 1898, p. 24.—Ed.]

Cuckoos' Eggs.—Among the Cuckoos' eggs which I have seen this year are three which are undoubtedly the eggs of the same hen Cuckoo, but not with those of the same species of foster-parent. All three were taken in an adjoining parish—the first on June 8th, with two eggs of the Hedge-Sparrow; the second on June 21st, also with two eggs of the Hedge-Sparrow; and the third on June 24th, with three eggs of the Yellow Bunting; all three being similar in size, shape, and colour, and having a very clearly defined zone at the larger end. A Cuckoo's egg (the reddest I have ever taken), which I found on July 3rd with three eggs of the Reed-Warbler, showed decided traces of incubation when being blown; but the three eggs with it were all quite fresh. The contrary state of things would have been easy to understand, but this I am unable to explain.—Julian G. Tuck (Tostock Rectory, Bury St. Edmunds, Suffolk).

Lesser White-fronted Goose (Anser erythropus) in Norfolk.—On Jan. 24th, 1900, an adult female of this exceedingly rare and perfectly distinct species of Wild Goose was procured in Norfolk, and is now in my collection. During my experience I have seen not merely hundreds, but probably thousands of the ordinary White-fronted Goose (*Anser albifrons*) in the flesh, and my eyes are thoroughly accustomed to the general outline and appearance of the bird. When this *A. erythropus* came into my possession in the flesh, I instantly detected its strikingly distinctive characters, and could not help wondering how any person who had ever seen the two birds in a freshly killed condition could doubt for a moment their specific distinctness. This is, I believe, the second instance only on record for Great Britain.—F. Coburn (7, Holloway Head, Birmingham).

Great Black-backed Gull inland in Wales.—Can any reader of 'The Zoologist' say whether the Great Black-backed Gull still breeds on the islet in Llyn Llydaw, under Snowdon, or not? The Rev. W. Bingley, who ascended Snowdon in either 1798 or 1801, stated that a small island in Llyn Llydaw was "in spring the haunt of the Black-backed Gulls (*Larus marinus* of Linnæus), which here lay their eggs and bring up their young" (North Wales, 1804). And Dr. Mavor's companions, when on Snowdon in 1805, near the edge of the precipice over the lakes, were enveloped in cloud, and heard the hoarse note of the Cob (*vide* Zool. 1886, p. 488, for this name), "a bird frequenting the alpine heights" ('The British Tourists' or Travellers' Companion,' 1809, vol. v. p. 276). Until the last few years these birds were reported to breed on an islet in an inland lake in Merionethshire; and this year (1901) I saw, on two occasions in May, a pair of fine old birds on the shore only a few miles from the said lake. Also, when was at Llyn Dinas, near Beddgelert, on May 13th, I saw three Great Black-backed Gulls pass over the lake, and go on up the valley, getting very high up in the air. One at least appeared to be adult, and I could see no dark marks on the tails of any of them. If they continued their flight for three miles up the valley, and then for about one and a half up a tributary stream, they would arrive at Llyn Llydaw. But they were perhaps rising in the air to go by a more direct route, crossing the wall of mountain. Llyn Llydaw is about twelve hundred feet higher than Llyn Dinas.—O. V. Aplin (Bloxham, Oxon).

Some Strange Nesting Habits in Holland.—The Oystercatcher, recorded as nesting on turf, is not the only bird in Holland to depart from its usual custom as known with us. The Common Tern, instead of nesting along the seashore, there nests as a Marsh Tern in fresh water, in company with Black Terns, as well as on short turf, in company or close proximity to the Oystercatcher. I have photographs of nests in both positions. The Common Heron, in one "meer" at all events, nests amid the reeds exactly like the Purple Heron, though elsewhere in Holland it nests in trees as in England.— R. B. Lodge (Enfield).

Birds in Nest-Boxes.—The following birds have nested in our boxes during the past season:—Nuthatch, Great Tit (seven or eight nests), Blue Tit, Tree-Sparrow (for the first time), House-Sparrow, Starling, and Wryneck. Going the round of the boxes one day, I found a Dormouse in one, which is nailed to an elm-tree about twelve feet from the ground, and I not unfrequently find Great Bats in them. These are undesirable tenants, as when they get into a box no bird will come there. In one box, the lid of which had been blown off in the winter, I found a Squirrel's nest. We find that our boxes here are most successful when put up at a height of about twelve or fourteen feet.—Julian G. Tuck (Tostock Rectory, Bury St. Edmunds, Suffolk).

PALÆONTOLOGY.

Fossil Vertebrates from Egypt.—I have recently returned from Egypt, where, in conjunction with the members of the Egyptian Geological Survey, I have been collecting vertebrate fossils from the Tertiary Beds of the Western Desert. The most important collection was made during an expedition with Mr. H. J. L. Beadnell, and includes remains of primitive Proboscidians from Upper Eocene and

Oligocene Beds. From the latter horizon the mandible of an animal closely allied to Mastodon was obtained.* In this two premolars and three molars are in place simultaneously, and none of the teeth have more than three transverse ridges. From the Upper Eocene came portions of the skeleton of a heavily built animal, the teeth of which somewhat resemble those of Dinotherium, but there are three premolars and three molars in both upper and lower jaws, and all the molar teeth are bilophodont except the last lower molar, which has a well-developed talon. The mandible is provided with a pair of procumbent tusks. The especial interest of these new forms is that hitherto no Proboscidea earlier than the Miocene were known. At the beginning of that period Mastodon and Dinotherium appeared in Europe, the region from which they were derived being uncertain. It now appears that they must have originated in the Ethiopian region, the tertiary vertebrate fauna of which has up till now been almost unknown. Numerous remains of Sirenians, Zeuglodonts, and various reptiles and fishes were also collected. — C. W. Andrews (Geological Department, British Museum).

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* This I am describing elsewhere in greater detail under the name *Palæomastodon beadnelli.* The Dinotherium-like animal mentioned below has been designated *Bradytherium grave.*

NOTICES OF NEW BOOKS.

Cambridge Natural History. Vol. VIII. *Amphibia and Reptiles.* By HANS GADOW, M.A., Ph.D., &c. Macmillan & Co., Limited.

THIS is a very welcome addition to the naturalist's library. In a general way the subject has been treated in the different serial zoological publications which have appeared during late years, but then the limit of space has been defined by the publisher rather than the limits of the subject by its author, while now a volume of some 650 pages has been devoted to it.

Dr. Gadow has done his work very thoroughly, and one very prominent and useful feature is to be found in the outline maps, which give at a glance the distribution of the larger groups and families. It is abundantly evident that this method is far clearer and much more convincing to the reader than a verbal enumeration of zoo-geographical provinces and regions, which are now no longer uniform in use and description. Thus when we come to the Frogs (*Ranidæ*) a glance at the map at once shows the startling fact to the uninitiated that practically none are found in Australia, and that they are also absent from the larger and southern portion of South America. We are also glad to see the correction of some popular and unexpected errors. We have all read and re-read Wallace's charming 'Malay Archipelago,' which has even a greater charm to those who have visited the region, and we well remember the account and figure of the Bornean "Flying Frog" (*Rhacophorus pardalis*). Specimens from Wallace's collection are in the British Museum, and it appears that the dimensions have been incorrectly given. It now appears that instead of the webs of all the feet together measuring about twelve square inches, they only measure three square inches. "By some unfortunate oversight Wallace must have mixed up the total expanded area with that of the four hands and feet."

In this publication the subjects are not restricted to "living animals," and the Dinosauria receive fuller treatment than that of the usual inscription on a zoological tombstone. We are no longer living in a Reptilian age, the sun of which has probably set for ever so far as this planet is concerned; and the practice has been too much to neglect the dead giants of the past in describing the living pigmies of the present. Dr. Gadow has not followed this unfortunate method of obscuration. We notice in respect to the "Snake-eating Cobra" (*Ophiophagus elaps*), it is stated that it reaches the enormous length, for a poisonous snake, of twelve feet or more. In 'The Zoologist' for 1875 (p. 4625) will be found the record of one brought from the Malay Peninsula, which was measured by Dr. Günther, and attained a length of 13 ft. 2 in.

This is really a book for reference, and maintains the high character of the series. The illustrations are excellent, and the drawings on wood have been, with few exceptions, made by Miss Durham, mostly from living specimens.

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